DEPARTMENT OF TRANSPORTATION - District 4 Toll Bridge Program
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August 13, 2009

Contract No. 04-0120F4
04-SF-80-13.2 / 13.9
Self-Anchored Suspension Bridge
Letter No. 05.03.01-004992

Michael Flowers
Project Executive
American Bridge/Fluor, A JV
375 Burma Road
Oakland, CA 94607

Dear Michael Flowers,

Request for Change Order (RFCO) No. 66 - OBG Skin Plate alignment

The Department has reviewed ABF-CAL-LTR-000993, dated July 23, 2009, and ZPMC Letter No. 20090722-01R1, dated July 22, 2009, and maintains that the repair work being performed by ZPMC to meet straightness and flatness requirements is not extra work. As stated in our previous letter, please proceed with the work and any necessary repairs in accordance with the currently approved Dimensional Control Plan (DCP).

It is noted that paragraphs 1-5 of ZPMC Letter No. 20090722-01R1 seem to be in agreement with State Letter 05.03.01-004667, although the intent of the statement, "*Not using any other unspecified measurements or beyond the special provisions,*" provided in paragraph 5 is not clear.

Paragraph 3 of ABF-CAL-LTR-000993, states that ABF does not agree with the Department's position on the length of a template that can be used to measure local flatness. The Department now agrees with ABF that for a panel the maximum length of a template or straight edge to measure panel flatness deviations is 1.5 x "D," where D is the least dimension of the panel.

Paragraph 4 of ABF-CAL-LTR-000993, states that ABF disagrees "*with the Department's interpretation of global flatness tolerance length used to measure OBG skin plates on a complete Segment/Lift.*" State Letter 05.03.01-004667 does not refer to tolerances for complete segments or lifts, but only to flatness requirements of individual panels bounded by stiffeners as prescribed by AASHTO Section 11.4.13.

Also in Paragraph 4 of ABF-CAL-LTR-000993, ABF has incorrectly interpreted AASHTO Section 11.4.13.2 regarding plates stiffened on one side only, such as orthotropic-deck plates. For a constant plate thickness, a flatness deviation calculated on one side of the panel is mirrored to the other side of the plate by continuity. Therefore, you can't have a larger flatness deviation on one side of the plate with a smaller flatness deviation on the other side, and still maintain a constant plate thickness.

The Department agrees that Items 1 and 2 of LOCAL PANEL FLATNESS are appropriate local flatness specifications and are "complementary," not "superseded," as stated incorrectly in Item 4 of State Letter 05.03.01-004667. However, the Department does take exception to Item 1, OVERALL STRAIGHTNESS. Neither Section 10-1.59, "Steel Structures," subsection "Shop Welding,"

subsection "Design Details," subsection G.3.b. of the Special Provisions; nor Section 3.5.1.2 in AWS D1.5: 2002 define L as equal to a segment length or lift length. Section G.3.b. of the Special Provisions simply states that the "*...girder shall be straight within 1:1000...*" and Section 3.5.1.2 in AWS states, *"Allowable variations in straightness of welded beams or girders...shall not exceed 1mm/m of total length, m."* However, the "total length" referred to in AWS is not defined as equal to either a segment length or length of an individual lift.

In the approved DCP, L is shown to be the 5m spacing between floorbeams, the unbraced length of the box shell plates. Defining L equal to the length of the longest segment or lift could result in unreasonable flatness deviation tolerances as large as 20mm to 70mm, respectively, which are structurally unacceptable and could result in buckling of the OBG. The straightness tolerances of the component walls of the box girder, which applies to all OBG skin plates and longitudinal stiffeners, between the floorbeams that are spaced 5m apart, shall be 5mm maximum. Flatness deviation tolerances greater than 5mm between the 5m spaced floor beams are structurally unacceptable.

The Department maintains that the Special Provision statement that the "Component walls of box girder shall be straight within 1:1000..." applies to this case and that for the floorbeam spacing of 5m this results in a 5mm maximum. The Department would also like to point out the problem at hand is the mismatch between the ends of adjacent segments which was addressed in the contract. The Contractor's attention is directed to the Special Provision stating that "The alignment of shell plates, ribs, and other matching plates of each box girder segment or lift to the adjacent segment or lift shall be checked during fabrication using a rigid steel template..." The Department recommends that the use of such template begin immediately in order to prevent recurrence of this problem.

Submittal and approval of the DCP is a contractual requirement, and ABF/ZPMC's DCP was submitted and approved with the correct interpretation of L. The Department fails to understand why at this time ABF considers work to meet the tolerances in their own DCP extra work.

Please contact Doug Coe at 137-6132-2704, or (510) 714-7079 if you have any questions or would like to discuss this issue further.

Sincerely,

GARY PURSELL
Resident Engineer

cc: Rick Morrow
Brian Boal
Doug Coe
Gary Pursell
Jason Thom
file: 05.03.01, 05.04.01